

**REMARKS**

Claims 2, 6, 8, 15, 22, 24-26, 28, 30-44 are pending in the application. Claims 7, 23, 27, and 29 are cancelled and Claims 40-44 are added to expedite prosecution.

Claims 2 and 26 are amended for clarity. Claim 35 is amended to have proper antecedent basis with Claim 6. Claims 37-39 are amended to have proper antecedent basis with Claim 26. Claim 8, 15, 22, 24, 36, are amended to depend from new Claim 41. Claims 15 and 26 are further amended for clarity. Claim 28 is amended to depend from new Claim 42.

Support for new Claim 40 is found for example at page 11, line 11 to page 12, line 2. Support for new Claims 41-44 is found for example at page 9, line 27 to page 10, line 8; page 29, line 8 to page 36, line 26; page 57, line 11 to page 59, line 6; page 20, lines 5-18; and page 20, line 27 to page 21, line 7.

No new matter is introduced by way of these amendments and the Examiner is respectfully requested to enter them.

**A. Written Statements under 37 C.F.R. § 1.133**

On December 5 and 11, 2003 and January 14, 2004, Diane Mason and David Stec conducted telephone interviews with Examiner Wang. As required by 37 C.F.R. § 1.133, Applicants submit this written statement of the reasons warranting favorable action presented during the interviews.

Applicants maintained the claims drawn to methods employing a composition comprising an aromatic compound free of antioxidants other than the aromatic compound are not obvious in view of Sotome and Tsuei *et al.*

Sotome's disclosure of cinnamic aldehyde/antioxidant emulsions teaches away from the claimed invention and, therefore, Sotome cannot support a *prima facie* conclusion of obviousness.

The Tseui *et al.* disclosure of microencapsulation methods in combination with Sotome does not teach or suggest the claimed compositions. Tseui *et al.* disclose microencapsulation to possibly protect a compound from oxidation but Tseui *et al.* do not teach or suggest microencapsulation as a substitute for the antioxidants of Sotome. Rather, Tseui *et al.* teach microencapsulating antioxidants, such as vitamin C and  $\beta$ -carotene, and provides working examples for each. Thus, in combination, Sotome and Tseui *et al.* teach the microencapsulation of the emulsions of Sotome comprising cinnamic aldehyde and an antioxidant.

Applicants maintained a microcapsule is a container and is not within the ambit of the art-recognized meaning of antioxidant. In addition, to practice the claimed invention of providing sustained resistance to a susceptible plant, release of the claimed compositions from a microcapsule is required.

Applicants express their gratitude to the Examiner for his availability for three telephone interviews and his comments and suggestions.

**B. Double Patenting Rejection**

Claims 2, 6-8, 15, 22-24, 25-28 and 31-34 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2, and 7-12 of U.S. Patent No. 5,839,224 to Emerson *et al.* in view of Sotome (U.S. Patent No. 4,978,686) and Tsuei *et al.* (U.S. Patent No. 5,589,194).

Claims 2, 6-8, 15, 25-28, 30-32, 36, 38, and 39 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-16 of (U.S. Patent No. 6,251,951) to Emerson, *et al.*.

Applicants defer responding to the double patenting rejections until there is an indication of otherwise allowable subject matter.

**C. 35 U.S.C. § 103 Rejections**

1. Sotome (US 4,987,686), Tsuei (5,589,194), Yamashita (5,696,094) and Frear (IDS C5)

Claims 2, 6-8, 15, 22-32, 36, 38, and 39 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sotome in view of Tsuei *et al.*, Yamashita, and Frear. Applicants respectfully traverse the rejection.

The rejection of Claims 7, 23, 27, and 29 is moot in view of the cancellation of these claims. Applicants address the rejection as it may apply to the currently pending claims.

Sotome describes a method of protecting crops from insect pests, microorganisms and pathogenic microbes using an emulsion of cinnamic aldehyde and an antioxidant. Sotome's examples of antioxidants include vitamin E, *n*-propylgallate, BHT, eugenol, Sankanon, and L-ascorbyl stearate. (*see* Column 3, lines 5-10; Table 1; Example 1).

Tsuei *et al.* describe a method of making microcapsules by dispersing or dissolving an active component in a solid, matrix-forming material that is thermally softened. Solid matrix-forming materials include waxes, such as, carnauba wax and beeswax. (*see* Column 4, lines 53-67). Tsuei *et al.* allege advantages of

microencapsulation including protecting a compound from oxidation. (*see* Column 4, lines 53-67). Examples of compounds suitable for microencapsulation are provided beginning at Column 4, line 7.

Yamashita describes a method of inhibiting soil borne, animal plant pathogens, such as nematodes, by treating the animal pathogen with lignosulfonate, which penetrates the pathogen's cuticle thereby increasing its susceptibility to soil microbes.

Frear describes the use of saponins as a spreading and wetting agent in insecticide sprays.

To reject a claim under § 103(a), the Examiner must "present a line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." M.P.E.P. § 2142 (citing *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. Appl. & Inter. 1985)). This requires the rationale for the rejection to meet the three basic criteria set forth in M.P.E.P. § 2143:

First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

"The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the

applicant is under no obligation to submit evidence of nonobviousness.” M.P.E.P.

§ 2142.

In the present case, the cited references, alone or in combination, do not disclose each of the elements of independent Claims 2, 26, 41, or 43. As the Examiner has acknowledged, Sotome does not teach or suggest a cinnamic aldehyde composition without an added antioxidant. Rather, Sotome teaches antioxidant/cinnamic aldehyde emulsions and states the antioxidant is required to maintain the antimicrobial effect of cinnamic aldehyde. According to Sotome, emulsions not containing an antioxidant lose their antimicrobial effect in about 30 days. In Example 1, Sotome compares the microbe inhibiting effect of cinnamic aldehyde in an emulsion with the antioxidant BHT (Emulsion A) and without BHT (Emulsion B). The microbes tested represent five genera of fungi. Sotome concludes: “Emulsion B lost its effect 30 days after the start of the test . . . whereas Emulsion A maintained its effect for the same time of [sic] period.” (see Column 6, lines 44-46). Sotome again reaches this conclusion in Example 2 in which the microbe inhibiting effects of Emulsions A and B were tested by transplanting cucumber seedlings with developed fifth leaves in soil contaminated with *Fusarium oxysporum*. (see Column 7, lines 16-19). Sotome concludes based on the results in Table 3: that “[I]n the case of the antioxidant-free Emulsion B, the microbe inhibiting effect was greatly lowered, while in the case of Emulsion A . . . the microbe inhibiting effect was maintained even after 30 days[.]” (see Column 7, lines 30-34).

In contrast to Sotome, the claims are drawn to methods employing compositions comprising aromatic compounds that are free of antioxidants other than

the aromatic compounds which provide susceptible plants sustained resistance to a pathogenic microorganism over a period of time that is substantially longer than the period of time disclosed by Sotome. As demonstrated in the specification, Example 1, treatment of a composition of antioxidant-free cinnamic aldehyde eradicated powdery mildew, rust, and spores from plants over an 8 week field study. (see p.37, lines 24-28). According to Sotome, the antioxidant-free cinnamic aldehyde loses its antimicrobial activity in about 30 days. Thus, Sotome teaches away from methods of using antioxidant-free aromatic compositions to provide a susceptible plant with sustained resistance to a pathogenic organism as instantly claimed.

In the Advisory Action, the Examiner contends the combination of Sotome and Tseui *et al.* support a conclusion of obviousness based on the theory that microencapsulation of active compounds as disclosed by Tseui *et al.* performs the function of the antioxidants of Sotome. The Examiner concludes by citing M.P.E.P. § 2144.01 II.A which states, the omission of an element, *i.e.*, antioxidants, and its function are obvious if the function of the element is not desired.

Applicants contend the function of the antioxidants of Sotome is to maintain the microbial inhibiting effect of the disclosed emulsions over a longer period of time than is possible in their absence. Applicants have not stated the maintenance of microbial inhibiting effect is not desired. Rather, Applicants have demonstrated microbial inhibiting effects of a composition comprising an aromatic compound being maintained in the absence of antioxidants. Thus, Applicants have demonstrated the omission of the antioxidants of Sotome with retention of their function. As M.P.E.P. § 2144.01 II.B. states, the omission of an element and

retention of its function is an indicia of nonobviousness. Therefore, Applicant's respectfully submit the rejection of the claims in view of M.P.E.P. § 2144.01 II.A is improper and Sotome does not support a conclusion of obviousness.

Regarding the combination of Sotome and Tseui *et al.*, Applicants interpret the Examiner's comments to mean the combination of these references teaches a skilled artisan to microencapsulate the emulsions of Sotome without the added antioxidant. Applicants respectfully disagree and contend the combination of Sotome and Tseui *et al.* when both references are viewed in their entirety does not support this conclusion. (*see* M.P.E.P. § 2141.02). Rather than teaching the use of a microcapsule as a substitute for the antioxidants of Sotome, Tseui *et al.* teach the microencapsulation of antioxidants. For example, at Column 4, beginning at line 7, Tseui *et al.* provide examples of compounds suitable for microencapsulation. These include Vitamin C and  $\beta$ -carotene, which are well-known antioxidants. Working examples of the microencapsulation of Vitamin C and  $\beta$ -carotene are provided in Examples 1 and 7, respectively. Therefore, Tseui *et al.* do not teach or suggest the microencapsulation of the compositions of Sotome without an antioxidant. Sotome and Tseui *et al.* teach the microencapsulation of the emulsions of Sotome with an antioxidant. Thus, Sotome and Tseui *et al.*, in combination do not support a legal conclusion of obviousness.

The remaining references, either alone or combination, do not cure the defects of Sotome and Tseui *et al.* Yamashita discloses nematodes as plant pathogens and Frear discloses the use of saponin as a surfactant in insecticides. These references do not address the defects of Sotome and Tseui *et al.* described above. Thus, none of

the references, either alone or in combination, teach or suggest at least one claim limitation, the nonphytotoxic compositions of Claims 2, 26, 41, and 43.

Because the references do not disclose all of the claimed elements, they cannot suggest their combination to arrive at the claimed invention. Without disclosure of all of the claimed elements and no suggestion that the references be combined, the references do not provide a reasonable expectation of success of arriving at the claimed invention.

Thus, Sotome, Tsuei *et al.*, Yamashita, and Frear do not meet any of the requirements to support a *prima facie* case of obviousness. Applicants respectfully request the rejection of the claims in view Sotome, Tsuei *et al.*, Yamashita, and Frear under § 103(a) be withdrawn.

2. Sotome (US 4,987,686), Tsuei *et al.* (5,589,194), Yamashita (5,696,094), Frear (IDS C5) and Winston (US 5,415,877)

Claims 33 and 34 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sotome in view of Tsuei *et al.*, Yamashita, Frear, and Winston. Applicants respectfully traverse.

Winston discloses a fungicide formulation comprising sodium bicarbonate. Summaries of Sotome, Tsuei *et al.*, Yamashita and Frear are provided above.

Claim 33 is drawn to a method of administering to a susceptible plant a nonphytotoxic composition comprising an aromatic compound selected from the group consisting of cinnamic aldehyde,  $\alpha$ -hexyl cinnamic aldehyde,  $\alpha$ -amyl cinnamic aldehyde, coniferyl aldehyde and combinations thereof that is free of antioxidants and



further comprises a salt of a polyprotic acid. Claim 34 limits the salt of a polyprotic acid of Claim 33 to sodium bicarbonate.

Applicants respectfully assert for the reasons set forth above that Sotome, Tsuei *et al.*, Yamashita, and Frear either alone or in combination do not support a *prima facie* case of obviousness. Winston does not cure the defects of these references *vis-à-vis* a nonphytotoxic composition comprising an aromatic compound that does not contain an antioxidant other than the aromatic compound. Thus, the combination of Winston with these references does not teach or suggest all the claim limitations and for the reasons set forth above does not establish a *prima facie* case of obviousness.

In view of these remarks, Applicants respectfully request that the rejection of Claims 33 and 34 under § 103(a) be withdrawn.

3. Sotome (US 4,987,686), Tsuei *et al.* (5,589,194), Yamashita (5,696,094), Frear (IDS C5) and Keane *et al.* (US CAPLUS Abstract AN 1979:471805)

Claims 35 and 37 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sotome in view of Tsuei *et al.*, Yamashita, Frear, and Keen *et al.* The Examiner contends that Keen *et al.* teach that coniferyl aldehyde is known to be useful as an antimicrobial agent for the protection of plants. The Examiner concludes it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, to employ coniferyl aldehyde in the method of Sotome because coniferyl aldehyde is structurally similar to cinnamic aldehyde and is a known antifungal agent. Applicants respectfully traverse.

Claims 35 and 37 depend from Claims 2 and 41, respectively, and limit the aromatic compound of each claim to  $\alpha$ -hexyl cinnamic aldehyde,  $\alpha$ -amyl cinnamic aldehyde, and coniferyl aldehyde.

Applicants respectfully assert for the reasons set forth above that Sotome, Tsuei *et al.*, Yamashita, and Frear either alone or in combination do not establish a *prima facie* case of obviousness. Keen *et al.* do not cure the defects of the references *vis-à-vis* a nonphytotoxic composition comprising an aromatic compound that is free of an antioxidant other than the aromatic compound. Thus, the combination of Keen *et al.* with the other references does not teach or suggest all the claim limitations and for the reasons set forth above does not establish a *prima facie* case of obviousness.

In view of these remarks, Applicants respectfully request the rejection of Claims 35 and 37 be withdrawn.


CONCLUSION

Applicants respectfully submit that the claims are now in condition for allowance and an early notification of such is solicited. If, upon review, the Examiner feels there are additional outstanding issues, the Examiner is invited to call the undersigned attorney at (415) 781-1989.

Respectfully submitted,

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